Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC

In the Matter of	)	
	)	
Preserving the Open Internet	)	GN Docket No. 09-191
	)	
Broadband Industry Practices	)	WC Docket No. 07-52

COMMENTS OF CLEARWIRE CORPORATION

Cathleen A. Massey
Vice President, Regulatory Affairs
& Public Policy
Chris Murray
Vice President, External Affairs
Erin Boone
Corporate Counsel, Regulatory Affairs
Clearwire Corporation
815 Connecticut Avenue, N.W.
Suite 610
Washington, D.C. 20006

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INTRODUCTION

Clearwire files these comments in response to the Commission's Notice of Proposed Rulemaking soliciting comments on draft rules to preserve an open Internet.[1] Clearwire supports the Commission's open Internet principles and comprehensive inquiry into the best means of preserving and promoting the open Internet. As the provider of the country's first 4G wireless WiMAX network designed specifically for the provision of broadband services, Clearwire embraces the practices and principles under consideration in this proceeding. Clearwire has developed a business model based on openness as a competitive differentiator that will attract more customers and application developers to its network services. For Clearwire, adopting open network standards and permitting customers to choose the devices and applications they want to use on the network are policies that set Clearwire apart from its competition. Clearwire's consistent adherence to the Commission's open Internet principles demonstrates that if carefully tailored, they are feasible for wireless broadband networks.

The important goal of network openness can be best achieved with a light touch and a regulatory environment that fosters investment and innovation in broadband networks. The Commission's principles should rely on transparency as a threshold for examining reasonable network management solutions and detecting anticompetitive behavior. Regulations that are too rigid or overly burdensome could create confusion and uncertainty regarding the future of broadband Internet access providers and their business models. Of course, in instances where anti-competitive conduct is shown, action should be taken to keep the Internet open and unfettered, but Clearwire urges the Commission to carefully choose its shots based on particular

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1 *Preserving the Open Internet, Broadband Industry Practices*, Notice of Proposed Rulemaking, GN Docket No. 09-191, WC Docket No. 07-52, 24 FCC Rcd 13064 (2009) (*NPRM*).

facts and circumstances. By crafting rules that are clear, yet flexible, the Commission can ensure that the still nascent broadband industry will meet its full potential.

I. BACKGROUND

Clearwire operates open, Internet-Protocol ("IP") 4G wireless broadband networks in 27 markets in the United States and Europe. These networks provide communities with high-speed residential and mobile Internet access and interconnected voice over Internet protocol (VoIP) services. As of the end of December 2009, Clearwire had over half a million wireless broadband subscribers and is rapidly deploying 4G broadband wireless service that utilizes the WiMAX technology standard in new markets and converting its pre-WiMAX markets to the 4G standard.[2] By the end of 2010, Clearwire's 4G WiMAX network is expected to be available in more than 80 markets covering up to 120 million people.[3] Because WiMAX technology is based on an open standard technology platform, device manufacturers are free to design various WiMAX compliant devices that can be accommodated on the Clearwire network. Proprietary systems, long the norm of the wireless industry, do not permit this type of flexibility. Developers and manufacturers creating devices and applications for WiMAX do not face the barrier of high licensing fees associated with proprietary systems, nor are they dealing with incumbent carriers looking to protect their investments in legacy services.

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[2] Clearwire provides 4G WiMAX service in 27 markets covering approximately 30 million people in places such as: Atlanta, GA; Baltimore, MD; Boise; ID; Chicago, IL; Las Vegas, NV; Philadelphia, PA; Charlotte, Raleigh, and Greensboro, NC; Honolulu and Maui, HI; Seattle and Bellingham, WA; Portland and Salem, OR; and Dallas/Ft. Worth, San Antonio, Austin, Abilene, Amarillo, Corpus Christi, Killeen/Temple, Lubbock, Midland/Odessa, Waco and Wichita Falls, TX.

[3] Among the markets scheduled to launch in 2010 are: New York, NY; Boston, MA; Washington, DC; Houston, TX and the San Francisco Bay Area.

With embedded WiMAX chipsets in laptops, phones, PDAs, mobile Internet devices and consumer electronic equipment, WiMAX technology will give users mobile access to a range of multimedia applications, such as videoconferencing, interactive video games, large data file transfer and more—anywhere in the coverage area. In addition to these consumer applications, a nationwide WiMAX network also offers unmatched utility to the public safety community, proponents of "smartgrid" technology, educators and telemedicine applications.

II. DISCUSSION

A. Clearwire Supports the FCC Open Internet Principles

Clearwire fully appreciates the need to ensure that the Internet remain open, and understands that both the Internet's openness, and the transparency of its protocols have been critical to its current success. Clearwire also agrees with the Commission that because of its historically open architecture, the Internet has been equally accessible to everyone, providing a level playing field for speech, entrepreneurship and innovation.[4] This accessibility has truly empowered individuals and organizations across the globe to compete in the new and ever-emerging global socio-economic landscape. Clearwire therefore supports the Commission's open Internet principles and offers suggestions for how they can be crafted to be both effective and flexible.

1. Clearwire's Business Model Supports an Open Internet Platform Similar to the Proposed Principles

From its very roots, Clearwire has adopted an open business model. Clearwire provides an open WiMAX network to both consumers and businesses that permits consumers to use any lawful device so long as it is a compatible WiMAX certified device and is not harmful to

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4 *NPRM* at ¶ 4.

Clearwire's network.[5] Clearwire also allows consumers to download and use any software applications, content, or services they desire, subject to the reasonable network management standards the Commission envisions. Openness is in Clearwire's DNA. It has built its network based on an open standard, and has committed to adhering to the four principles set forth in the Commission's *Internet Policy Statement* which were intended by the Commission "to ensure that broadband networks are widely deployed, open, affordable, and accessible to all consumers."[6] What distinguishes Clearwire is that from its inception its primary service offering has been high-speed broadband Internet access. Unlike incumbent carriers, Clearwire is not concerned that its new, innovative broadband offerings will cannibalize revenues from traditional services.

Clearwire's Mobile WiMAX technology is based on the 802.16e-2005 IEEE standard. It is an open standard that builds off the success of the 802.11 IEEE family of standards more commonly known as Wi-Fi. The success of Wi-Fi—due in large part to its extraordinarily low barrier to entry—is precisely the template Clearwire envisions for its network. Because of its

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[5] Clearwire adheres to the open devices principle initially defined in the Commission's *700 MHz Auction Order*, requiring C Block licensees to "allow customers, device manufacturers, third-party application developers, and others to use or develop the devices and applications of their choosing in C Block networks, so long as they meet all applicable regulatory requirements and comply with reasonable conditions related to management of the wireless network (*i.e.*, do not cause harm to the network)." *Implementing a Nationwide, Broadband, Interoperable Public Safety Network in the 700 MHz Band*, Second Report and Order, PS Docket No. 06-229, 22 FCC Rcd 15289 at ¶ 206. *See also* http://wimaxforum.org/certification/certification-overview.

[6] *Appropriate Framework for Broadband Access to the Internet over Wireline Facilities; Review of Regulatory Requirements for Incumbent LEC Broadband Telecommunications Services; Computer III Further Remand Proceedings: Bell Operating Company Provision of Enhanced Services; 1998 Biennial Regulatory Review – Review of Computer III and ONA Safeguards and Requirements; Inquiry Concerning High-Speed Access to the Internet Over Cable and Other Facilities; Internet Over Cable Declaratory Ruling; Appropriate Regulatory Treatment for Broadband Access to the Internet Over Cable Facilities*, Policy Statement, CC Docket Nos. 02-33, 01-337, 95-20, 98-10, GN Docket No. 00-185, CS Docket No. 02-52, 20 FCC Rcd 14986, 14988 ¶ 4 (2005) ("*Internet Policy Statement*").

openness, Clearwire expects mobile WiMAX to attract many equipment vendors in the IT and consumer electronic industries just as Wi-Fi has done.

In contrast to the "walled garden" closed platform model some carriers are trying to protect is the Clearwire "Innovation Network," designed to make it easier for applications and device developers to create products and services. In September of 2009, Clearwire launched the CLEAR 4G WiMAX Innovation Network to provide the software development community in Silicon Valley with the nation's largest 4G WiMAX application test environment.[7] This developer network, which is a precursor to commercial service planned for the San Francisco Bay Area in 2010, covers more than 20 square miles in Santa Clara, Mountain View and parts of downtown Palo Alto, California. The current coverage footprint includes the local campuses of Intel and Google, two founding Innovation Network supporters that have also commenced their own internal 4G application development programs. Cisco's campus will receive coverage in the coming months as the network expands.

Developers using the Innovation Network can expect peak download speeds of up to 10 Mbps, with average download speeds of 3 to 6 Mbps, easily surpassing today's 3G wireless networks that typically deliver download speeds between 600 Kbps and 1.4 Mbps. Using 4G WiMAX technology, the Innovation Network will provide Wi-Fi speeds without the short-range limitations of a traditional hot spot, instead providing service to large areas rather than individual coffee shops. In addition, WiMAX technology is truly mobile and enables seamless handovers from tower to tower, similar to cellular networks.

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[7] *See* Press Release, Clearwire, Clearwire Launches CLEAR 4G WiMAX Innovation Network in Silicon Valley (Sept. 15, 2009), http://newsroom.clearwire.com/phoenix.zhtml?c=214419&p=irol-newsArticle&ID=1331811&highlight=.

The Innovation Network provides service free to a number of qualified developers leading up to the commercial service launch in this area. Other developers can gain access to the network via a small monthly fee, thus significantly reducing start-up costs for small developers and moving towards the Commission's goal of fostering "the pragmatic application of new ideas to productive ends."[8] This testing environment will provide innovators with access to true mobile broadband so they can test and develop new technologies, including spectrum-sensing and frequency-agile devices, along with various types of software-defined smart radios. Clearwire anticipates that the Innovation Network will foster not only new wireless devices, but also wireless applications, including mobile video, location-based, and innovative gaming services. With the Innovation Network, Clearwire and its partners hope to incubate new, creative ideas that will attract additional interest and investment, eventually bringing the best of those products and services to market.

Clearwire's open network model concept permits customers to purchase a variety of devices through any number of consumer electronics distribution channels, connect to the network, activate the device, and select from a variety of rate plans without having to purchase devices or applications from Clearwire itself.[9] Taken together with its provision of non-exclusive wholesale access to its WiMAX service, Clearwire's unparalleled openness has and will continue to generate new forms of competition among software applications providers,

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[8] *Fostering Innovation and Investment in the Wireless Communications Market; A National Broadband Plan For Our Future*, Notice of Inquiry, GN Docket Nos. 09-157 and 09-51, 24 FCC Rcd 11322 (2009) at ¶ 2 (defining "innovation").

[9] *See Sprint Nextel Corporation and Clearwire Corporation Seek FCC Consent to Transfer Control of Licenses and Authorizations*, Public Notice, DA 08-1477, WT Docket No. 08-94 (rel. June 24, 2008) ("Public Notice"); *Sprint Nextel Corporation and Clearwire Corporation Seek FCC Consent to Transfer Control of Licenses and Authorizations*, Erratum, WT Docket No. 08-94 (rel. July 11, 2008), Public Interest Statement at 26-27.

content providers, device manufacturers, and wholesale partners to create a rich broadband environment for consumers.

Clearwire does not have exclusive device arrangements with any manufacturers, and its open network model will encourage the continual creation of new applications and services to support its customers. In addition to voice and web browsing, Clearwire's network allows for value added services provided both by Clearwire and by innovators enabled by its open networks such as live videoconferencing, video on demand, online gaming, music broadcast programming, and location-based services. Clearwire also plans to open its networks to consumer electronics companies seeking a distribution channel for their products – Amazon's Kindle reader, for example – thus providing wireless connectivity to an innovator without disrupting its relationship with its customer.

Clearwire adopted openness even in the absence of federal rules because openness is good for its business. In a more competitive wireless market, innovative developers will gravitate towards those networks that do not impose restrictive technical requirements or prohibitively expensive entrance costs. This will increase network usage and revenues as Cleawire's customers take advantage of a wide range of device and application options. Clearwire believes providing this type of customer-driven choice will stimulate consumer demand and drive innovation and investment in the development of broadband devices and applications beyond that achievable by closed proprietary networks. Openness is not merely an important policy issue, it is good business practice.

B. Openness Policies Should be Flexible, Clear and Consistent with the Equally Important Goal of Facilitating Investment and Innovation in Next Generation 4G Networks

In its interim report to the Commission regarding the development of a National Broadband Plan, the Commission's Broadband task force presented data that graphically demonstrated the challenges facing companies like Clearwire that are establishing new broadband access networks.[10] The taskforce estimated that it would cost between 20 and 350 billion dollars to construct a new, nationwide broadband network, a staggering undertaking for even the well-financed company.[11] Indeed, each milestone in Clearwire's development and deployment of a broadband network has been reached because of Clearwire's ability to attract investors, even in a troubled economic environment. Although this proceeding is intended to explore ways to protect investment and innovation in Internet services, the Commission should also be mindful of the need to protect investment and innovation in the networks themselves that require vast amounts of capital and a long-term business plan that can attract a multi-year commitment from investors.

In fact, the growing presence of Clearwire across the country—and its commitment to the open Internet policies—promises to rapidly disrupt existing technology and business models and help the Commission to achieve many of the goals being explored in this proceeding. Indeed, it is the launch of advanced broadband networks that have fueled the engines of explosive development and innovation of Internet applications and services. It is Clearwire's experience that as consumers enjoy a richer, more robust experience offered by 4G, their demand for broadband capacity increases exponentially at a rate that outstrips all expectations. So the

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10 *See National Broadband Plan Status Report Presentation* at Slide 45 (rel. Sept. 29, 2009) (*Status Report*).

11 *See Status Report* at Slide 45.

challenge presented by the proceeding is not simply to craft policies that preserve the open Internet. Equally as imperative is the need to create a stable, predictable regulatory environment for broadband access providers that underpins the open Internet.

To achieve this two-part goal, Clearwire recommends the following: First, the Commission's acknowledgement that wireless networks are different from wired networks (and present a complex set of network management challenges) should inform any action taken in this proceeding. Second, the Commission should rely on transparency in determining as a threshold matter whether a network management practice appears to be reasonable. When practices are set out in clear, concise language that consumers, application, content and service providers can understand, the market is better able to discipline strategies or practices that have some element of anti-competitive intent without the need for overly-prescriptive rules. Third, the Commission should define a managed service as one that is provided to customers pursuant to specific service quality protocols critical to the operation of that service. Fourth, Clearwire agrees with the Commission that nondiscrimination is an appropriate principle for this open Internet proceeding, but should be modeled after Section 202(a) of the Act.

1. The Commission's Principles, if Carefully Tailored, are Generally Feasible for Wireless Broadband Networks

The question of whether the Commission's *Internet Policy Statement*[12] applies to wireless network providers is being quickly overtaken by a debate regarding the feasibility of applying such policies to wireless networks. Clearwire's consistent adherence to the open Internet principles in crafting its network management policies demonstrates that they are generally

12 *See Internet Policy Statement*, 20 FCC Rcd 14986.

feasible for wireless broadband networks.[13] As the Commission acknowledges in the NPRM, however, "technological, market structure, consumer usage and historical regulatory differences between different Internet access platforms may justify differences in *how* we apply the Internet openness principles . . ."[14] Clearwire urges the Commission to recognize that it should carefully construct rules implementing its open Internet policies in a manner that recognizes every step along the way the differences between wireless, particularly mobile, and other broadband network platforms.

It is an intricate process to support broadband services over a mobile wireless broadband network. In mobile broadband networks, spectrum assets are inherently shared, creating a greater potential for network congestion than is found with a wireline broadband network, where each end user has dedicated access. The same wideband radio channel must be shared among many user sessions that may each involve many different types of data streams and protocols. For instance, some applications require time sensitive, small packet data transmissions while other applications require long, error sensitive large packet data streams. In addition, throughput, latency, and transmission errors vary much more widely over a mobile network because of constantly fluctuating radio signal conditions and extensive digital radio processing. In order to accommodate technical differences among various network technologies, the Commission should ensure that its application of the proposed new rules is as nimble as possible and that those same rules are crafted in a technology agnostic manner.

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13 Clearwire's 4G network, from its inception, has been designed specifically for the provision of advanced broadband services. The Commission may find it less technically feasible to apply open Internet principles to earlier generations of wireless networks that were originally voice-centric, with less overall bandwidth.

14 *NPRM* at ¶ 154.

2. The Commission's Principles Should Rely on Transparency As a Threshold for Examining Reasonable Network Management Solutions and Detecting Anti-Competitive Behavior

Clearwire asks that the Commission proceed cautiously before prescribing explicit rules for how network providers—especially wireless broadband providers—may develop and implement their network management strategies. Overly rigid rules could upset the development of new technologies and innovative business models such as Clearwire's. As a threshold principle, carriers should offer full transparency to customers, applications, content and service providers about their network management practices, and how those practices may affect their experience. The Commission should only restrict strategies or practices that appear to have an element of anti-competitive intent—for example, if the practice is designed principally to favor carrier-provided services over other services, the practice should be subject to particular scrutiny.

There are numerous business and technical reasons for network providers to occasionally employ pro-consumer strategies that do not unequivocally treat every bit that traverses their networks in precisely the same manner. For wireless network providers, in particular, network management cannot be divorced from spectrum management. As the Commission itself has repeatedly acknowledged, spectrum is never an unlimited resource [15] and the ability to use reasonable network management techniques is inescapably a vital component to running a functional wireless network. In addition, a strategy is applied in a neutral and manner, and a network provider fully describes to its customers how, when and why that strategy may impact their usage, then the practice should be presumed reasonable unless there is evidence of anti-competitive motivation or intent.

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[15] *See Comment Sought on Spectrum for Broadband*, GN Dockets 09-47, 09-51, 09-137, *NBP Public Notice #6*, (rel. Sept. 23, 2009); *see also Data Sought on Uses of Spectrum*, GN Docket Nos. 09-47, 09-51, 09-137, *NBP Public Notice #26*, (rel. Dec. 2, 2009), among others.

For instance, a customer may choose to download an episode of his or her favorite television show from a popular online video service provider, such as Hulu.[16] Once that customer initiates the download, his or her network provider may choose to prioritize that application for that customer so that he or she can enjoy an uninterrupted stream of the episode. The prioritization of the episode may have the unintended consequence of limiting the bandwidth of other subscribers in the same geographic area, who may have attempted to download a video or other application following the initial customer's download. The network provider would then attempt to perform the same prioritization for the next customer in line after the initial customer's download is complete. This "first come, first served" method can be viewed as both "reasonable," and "discriminatory" at the same time. However, its intent is purely in the interest of maximizing the consumer experience.

If in the name of treating all data bits equally, such a policy is prohibited without exception, and the network provider is unable to perform sufficient network management, via a "discriminatory" practice or otherwise, all subscribers in that sector who attempt to download a video stream will experience slowed, inconsistent quality when attempting his or her particular download. On the other hand, if this "first come, first served" practice is disclosed, an informed subscriber may support the policy as providing an overall better customer experience—but at least the subscriber will have a chance to vote with his or her feet, and provide some feedback to the market. As discussed above, the unintended consequences flowing from an overly rigid set of regulations would be particularly harmful for mobile wireless broadband network providers. Mobile wireless broadband providers face unique challenges when attempting to efficiently and

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16 *See* http://www.hulu.com/about/product_tour.

effectively manage their networks to best serve their customers, and allow them to fully enjoy the robust, next-generation services mobile broadband networks are capable of providing.

3. Clearwire Supports the Commission's Proposal to Create a Category of "Managed" or "Specialized" Services

Clearwire applauds the Commission for recognizing that certain categories of services may need to be excluded from its proposed open Internet principles, and inquiring how or why those services may be different. Clearwire agrees that there are categories of "managed" or "specialized" services that "may provide consumer benefits, including greater competition among voice and subscription video providers, and may lead to increased deployment of broadband networks."[17] The Commission also asks whether allocation of available bandwidth for managed services is different and/or critical, whether these services should be uniquely classified by the Commission, and what policies, if any, should apply to these services.[18] Clearwire believes that the allocation of bandwidth to particular categories of managed services, such as voice and certain types of video applications, is crucial from a business and technical standpoint. Clearwire's enterprise and wholesale customers demand managed services, supported by a Quality of Service (QoS) assurance, as a service offering that is distinct from broadband Internet access services.

To ensure that managed services are accommodated, the Commission should carefully craft an evolving definition adaptable enough to include future managed services along with those services, such as voice and video, which are currently deployed and explicitly recognized by the Commission in this *NPRM*.[19] Crafting a broad definition will allow network providers to

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17 *NPRM* at ¶ 148.

18 *Id.* at ¶¶ 151-153.

19 *See NPRM* at ¶ 148

treat novel or unique services, which may need distinct treatment from broadband Internet access services, as managed or specialized services free from rules that may hinder the ability of a network provider to make them available.

In addition to recognizing the need for a category of managed or specialized services, the Commission asks whether and how it should classify and otherwise define services categorized under the managed or specialized services exception.[20] Clearwire suggests that the Commission define a managed service as one that is provided to customers, including wholesale customers, pursuant to specific QoS protocols critical to the operation of that service. This service may run side-by-side with a carrier's broadband Internet access service, but has distinct attributes or requirements that demand QoS and specialized network management in its provision, such as voice traffic, which must be provided via an uninterrupted stream. To provide acceptable QoS to these services, a network must be able to identify and combine many different types of traffic from many different users without compromising the performance of any of the different user applications. On a mobile broadband network, this must be done for any number of services at any given time and in any given location. Therefore, the Commission's definition and of managed or specialized services should be broad enough to ensure that current and future services requiring specialized QoS or allocation of significant bandwidth for their successful provision will be included in that definition.

4. The Commission's Proposed Nondiscrimination Principle Should Mirror the Prohibition Against Unjust and Unreasonable Discrimination in Section 202(a) of the Act

Clearwire agrees with the Commission that nondiscrimination is an appropriate principle to consider for this open Internet proceeding, but that it should be modeled after Section 202(a)

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20 *NPRM* at ¶ 149.

of the Act.[21] The nondiscrimination prohibitions imposed by Section 251(c)[22] were placed upon incumbents who had *monopoly* control over a legacy network and were designed to ensure competition could be both established and thrive over a network where it did not exist before. The Section 251(c) nondiscrimination standard has not yet proven necessary in the broadband Internet access market, in which both incumbents and new entrants are already competing vigorously.

The Section 202(a) "unjust and unreasonable" discrimination standard will ensure that broadband Internet access providers cannot engage in the anticompetitive activities that the proposed nondiscrimination principle intends to thwart.[23] The Section 202(a) standard is also more definitive than the currently proposed "reasonable network management" standard for gauging discriminatory behavior.[24] The Section 202(a) standard accomplishes the Commission's goals while at the same time providing broadband Internet access service providers the freedom necessary to fully develop businesses models, innovative services and applications that are in their infancy, or have yet to be developed. These include innovative pricing strategies, content and new applications, among others.

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21 "It shall be unlawful for any common carrier to make any *unjust or unreasonable discrimination* [emphasis added] in charges, practices, classifications, facilities, or services for or in connection with like communication service, directly or indirectly, by any means or device, or to make or give any undue or unreasonable preference or advantage to any particular person, class of persons, or locality . . ." 47 U.S.C. § 202(a).

22 47 U.S.C. § 251(c)(2)(D).

23 The Commission states that "the ability of network operators to discriminate in price or service quality among different types of traffic or different providers or users may impose significant social costs, particularly if the discrimination is motivated by anticompetitive purposes." *NPRM* at ¶ 103.

24 The Commission's proposed nondiscrimination principle is imposed "[s]ubject to reasonable network management," which should be interpreted differently based on the technological characteristics of certain types of network providers (*e.g.*, wireless). *See* NPRM at ¶ 104.

CONCLUSION

In conclusion, Clearwire supports the Commission's comprehensive inquiry into the best means of preserving and promoting the open Internet and embraces the practices and principles under consideration in this proceeding. Clearwire also urges the Commission to carefully consider particular facts and circumstances in crafting rules that are clear, yet flexible, to ensure that the still nascent broadband industry will meet its full potential. Clearwire respectfully submits the foregoing comments and asks that the Commission consider the views expressed herein.

Respectfully submitted,

CLEARWIRE CORPORATION

/s/ Cathleen A. Massey
Cathleen A. Massey
Vice President, Regulatory Affairs & Public Policy

/s/ Chris Murray
Chris Murray
Vice President, External Affairs

/s/ Erin Boone
Erin Boone
Corporate Counsel, Regulatory Affairs

815 Connecticut Avenue, NW, Suite 610
Washington, DC 20006
(202) 429-0107

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